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(54) METHOD AND DEVICE FOR ALTERING PLAYING DATA AND MEDIUM RECORDED WITH PROGRAM
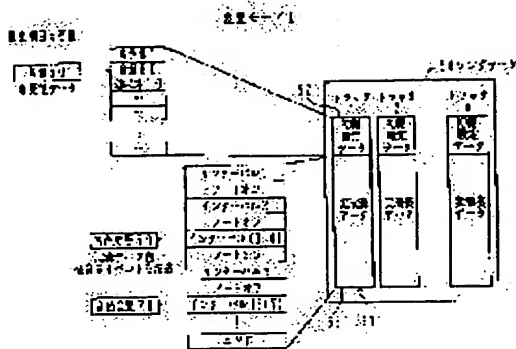
(57)Abstract:

PROBLEM TO BE SOLVED: To automatically alter the whole playing data without a feeling of physical disorder by retrieving data of the same kind with indicated data to be altered from actual playing data and altering or erasing the retrieved data according to an indication.

SOLUTION: When a user indicates an alteration of sound volume in initial setting data, for example, from 50 to 80, a playing data altering device generates new initial setting data 52. The playing data altering device discriminates the kind of an even of the alteration that the user indicates. Then an event of the same kind with the even is erased from the actual playing data and actual playing data 53 are generated. For example, an even such as a sound volume alteration 60 and a sound volume alteration 70 is erased. Then all the events of sound volume alterations in the actual playing data 53 are erased and then the setting of sound volume 80 in the initial setting data 52 becomes effective to the whole in the playing data 51 in principle. The user becomes able to set the reference sound volume of the whole music to 80.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] Especially this invention relates to modification processing of performance data in which the value of performance data can be changed into a desired value, about processing of performance data.

[0002]

[Description of the Prior Art] Drawing 7 is drawing showing the format of song data.

[0003] The song data 4 are automatic performance data for one music, and have each performance data 1 of a truck 1 · Truck n. When the song data 4 are recorded in the form of the Standard MIDI File, the performance data 1 are expressed using the format of MIDI data. MIDI data have setting data note-on / for it being off and also setting up a tone, effectiveness, etc.

[0004] The initialization data 2 are put on the part of the head of the performance data 1 in many cases. The initialization data 2 are setting data set up beforehand, in order to perform the music, for example, they are a tone, sound volume, or effectiveness.

[0005] The performance data 1 are roughly divided and consist of the above-mentioned initialization data 2 and real performance data 3 which continue after that. The real performance data 3 are performance data other than initialization data 2, for example, are data after the note-on which appears in the beginning of music.

[0006] The real performance data 3 carry out an interval and an event at 1 set, and are constituted. The real performance data 3 contain setting data (sound-volume modification etc.) effective only in the specific section besides note-on / OFF.

[0007] In order to perform an automatic performance, the initialization data 2 are read first, initial setting, such as a tone, is performed, the real performance data 3 are read after that, and the automatic performance including pronunciation and silence is performed. The performance data 1 finish with end data.

[0008]

[Problem(s) to be Solved by the Invention] A user has the case where he wants to change the performance data 1, according to liking of him. In that case, each event or interval of the performance data 1 can be changed using a sequencer or a personal computer.

[0009] However, since there is little knowledge about performance data, if the initialization data 2 are changed, when the modification of the beginner is effective in the whole performance data 1, he may have misunderstanding. For example, if the sound volume 50 in the initialization data 2 is changed into 80, when sound volume can be raised from the head of music over all to the last, it may have misunderstanding.

[0010] In fact, even if it changes the sound volume in the initialization data 2 into 80 from 50, the sound-volume modification 60 and the sound-volume modification 70 which exist in the real performance data 3 are not changed. Early sound volume is 50 and sound volume goes up the performance data before modification to 60 and 70 after that. However, early sound volume is 80, and after that, sound volume will once fall in 60 and then will go up the performance data after modification to 70. A modification front and after modification, sensibility of music changes and sense of incongruity is sensed.

[0011] The purpose of this invention is offering the record medium of the performance data modification equipment which makes an automatic change of the whole performance data by modification of initialization data so that there may be no sense of incongruity, the performance data modification approach, or a program.

[0012]

[Means for Solving the Problem] A modification directions means to change the performance data which consist of initialization data and real performance data according to one viewpoint of this invention and to be equipment and to direct modification of the data in initialization data, The performance data modification equipment which has a retrieval means to search the data to which said modification was directed, and data of the same kind out of real performance data, and a modification means to perform modification or elimination for said searched data according to said directed modification is offered.

[0013] Only by carrying out the modification directions of the data in initialization data, it can change or eliminate according to modification to which said directions data in real performance data and data of the same kind were directed. That is, if modification of initialization data is directed, the modification directions can be confirmed over the whole performance data.

[0014]

[Embodiment of the Invention] The case where the performance data 1 shown in

drawing 7 are changed is explained to an example. A user only operates it so that he may change the initialization data 2 in the performance data 1, and he can change a request over the performance data 1 whole (the real performance data 2 are included).

[0015] A user may wish various modification according to his liking or performance environment etc. For example, if the sound volume of initialization data is raised, only the daily dose same about the whole performance data has the case where he wants to raise sound volume. Moreover, if the sound volume of initialization data is changed, there is a case where he wants to change the whole performance data into the same sound volume as the changed sound volume. In addition, there are various requests.

[0016] When changing the performance data 1, a user chooses one mode of the maintenance modes 1-4 of drawing 1 -4 first in order to decide what kind of change want to make. Performance data modification equipment can make various change about performance data according to the mode which the user chose. Modification in each maintenance modes 1-4 is shown in drawing 1 - drawing 4 , respectively.

[0017] Drawing 1 is drawing for explaining actuation of maintenance mode 1. In maintenance mode 1, the performance data 1 (drawing 7 R> 7) are changed into the performance data 51 (drawing 1). The initialization data 2 and the real performance data 3 in the performance data 1 are changed into the initialization data 52 and the real performance data 53 in the performance data 51, respectively.

[0018] If a user directs to change the sound volume for example, in initialization data into 80 from 50, performance data modification equipment will generate the new initialization data 52. And the real performance data 53 shown below are generated.

[0019] Specifically, performance data modification equipment identifies first the class of event modification was instructed to be by the user. The class of event is sound volume. Then, the event of the same class as the event concerned is eliminated from the inside of the real performance data 3, and the real performance data 53 are generated. For example, the event of the sound-volume modification 60 and sound-volume modification 70 grade is eliminated.

[0020] By eliminating all the events of sound-volume modification in the real performance data 53, a setup of the sound volume 80 in the initialization data 52 becomes effective in all in the performance data 51 as a principle. A user can set the reference volume of the whole music as 80.

[0021] In addition, if the event of the sound-volume modification 60 in real performance data and the sound-volume modification 70 is eliminated, an interval 4 is added with the interval 3 before that, it will collect into one interval, an interval 7 will be added with the interval 6 before that, and it will collect into one interval. Approaches, such as

eliminating and leaving both of either between two intervals besides said approach, may be used.

[0022] Drawing 2 is drawing for explaining actuation of maintenance mode 2. In maintenance mode 2, the performance data 1 (drawing 7 R> 7) are changed into the performance data 61 (drawing 2). If a user directs to change the sound volume for example, in the initialization data 2 into 80 from 50, performance data modification equipment will generate the new initialization data 62 based on the original initialization data 2.

[0023] According to modification directions of the above-mentioned user, performance data modification equipment changes the original real performance data 3, and generates the new real performance data 63. Performance data modification equipment identifies first the class (for example, sound volume) of event modification was instructed to be by the user, and, specifically, changes all the events of the same class as the event concerned into the same value into real performance data after that. For example, both the events of the sound-volume modification 60 and the sound-volume modification 70 are changed into the sound-volume modification 80.

[0024] since the same sound volume as the sound volume 80 in the initialization data 62 is set up in the real performance data 63, sound volume can be set as the magnitude of about 1 law over the performance data 61 whole.

[0025] Drawing 3 is drawing for explaining actuation of maintenance mode 3. In maintenance mode 3, the performance data 1 (drawing 7 R> 7) are changed into the performance data 71 (drawing 3). If a user directs to change the sound volume for example, in the initialization data 2 into 80 from 50, performance data modification equipment will generate the new initialization data 72 based on the original initialization data 2.

[0026] According to modification directions of the above-mentioned user, performance data modification equipment changes the original real performance data 3, and generates the new real performance data 73. Performance data modification equipment identifies first the class (for example, sound volume) of event modification was instructed to be by the user, and, specifically, investigates the amount of modification of the value modification was further instructed to be. The amount of modification is the sound-volume 80-sound volume 50= +30. Then, only the same amount of modification changes all the values of the same event of a class as the event concerned into real performance data. For example, the sound-volume modification 60 and the sound-volume modification 70 are changed into the sound-volume modification 90 (= 60+30) and the sound-volume modification 100 (= 70+30), respectively.

[0027] it is the same as the amount of modification in the initialization data 72 -- the data in ** and the real performance data 73 are changed. On the whole, as for performance data, only the amount sound volume was instructed to be by the user is changed. That is, on the whole, the sound volume of performance data can be changed, without changing the balance of relative sound volume.

[0028] However, this maintenance mode is effective when there are few amounts of modification, but when the amount of modification becomes large too much, sound volume may exceed maximum or may become smaller than 0. In that case, a limiter may be prepared in maximum and 0. Moreover, the amount of modification is too large, and when the image of music changes, the maintenance mode 4 explained below is effective.

[0029] Drawing 4 is drawing for explaining actuation of maintenance mode 4. In maintenance mode 4, the performance data 1 (drawing 7 R> 7) are changed into the performance data 81 (drawing 4). If a user directs to change the sound volume for example, in the initialization data 2 into 80 from 50, performance data modification equipment will generate the new initialization data 82 based on the original initialization data 2.

[0030] According to modification directions of the above-mentioned user, performance data modification equipment changes the original real performance data 3, and generates the new real performance data 83. Performance data modification equipment identifies first the class (for example, sound volume) of event modification was instructed to be by the user, and, specifically, investigates the modification scale factor of the value modification was further instructed to be. A modification scale factor is sound-volume 80/ sound volume 50= 1.6. Then, only the same modification scale factor changes all the values of the same event of a class as the event concerned into real performance data. For example, the sound-volume modification 60 and the sound-volume modification 70 are changed into the sound-volume modification 96 (= 60x1.6) and the sound-volume modification 112 (= 70x1.6), respectively.

[0031] it is the same as the modification scale factor in the initialization data 82 -- the data in ** and the real performance data 83 are changed. On the whole, as for performance data, only the scale factor sound volume was instructed to be by the user is changed. On the whole, the sound volume of performance data can be changed into audibility top nature.

[0032] Drawing 5 shows the configuration of the hardware of the electrohone containing the performance data modification equipment by the example of this invention.

[0033] The keyboard detector 28, the switch detector 30, a display circuit 31, the

sound-source circuit 32, the effectiveness circuit 33, RAM21, ROM22 and CPU23, external storage 25, and an interface 26 are connected to a bus 35.

[0034] A user can direct modification of initialization data using a switch 29. The switch detector 30 detects the switch actuation which used the switch 29, and generates a switch signal.

[0035] A user can also direct modification of initialization data using a keyboard 27. The keyboard detector 28 detects the key actuation which used the keyboard 27, and generates note-on or a note off signal. However, a keyboard 27 is not necessarily required.

[0036] In a display circuit 31, a modification front stirrup can display the performance data after modification. A user can direct modification of initialization data, referring to the performance data displayed on a display circuit 31.

[0037] External storage 25 is connected to a bus 35 through the interface including the interface for external storage. External storage 25 is for example, a floppy disk drive (FDD), a hard disk drive (HDD) and a magneto-optic-disk (MO) drive, a CD-ROM (compact disk-read only memory) drive, etc.

[0038] RAM21 has the working area for CPU23 which memorizes a flag or a buffer, MIDI performance data, etc. ROM22 memorizes various parameters and a control program, or the performance data alteration program in this example. CPU23 performs operation or control according to the control program memorized by ROM22.

[0039] It connects with CPU23 and a timer 24 directs interruption processing timing to CPU23. An interface 26 is a MIDI interface or an interface for other communication networks.

[0040] The performance data before modification are memorized by an outboard recorder 25, RAM21, or ROM22. The performance data after modification are written in the external storage 25 or RAM21 which can be written in. A modification front stirrup can output and input the performance data after modification to the exterior through an interface 26.

[0041] From RAM21 grade, a modification front stirrup can read the performance data after modification, and CPU23 can supply a musical-sound parameter and an efficacy parameter to the sound-source circuit 32 and the effectiveness circuit 33, respectively.

[0042] Moreover, according to the switch signal generated in the note-on signal generated in the keyboard detector 28, and the switch detector 30, CPU23 can generate a musical-sound parameter and an efficacy parameter, and can also supply them to the sound-source circuit 32 and the effectiveness circuit 33, respectively.

[0043] The sound-source circuit 32 generates a musical-sound signal according to the

musical-sound parameter supplied. The effectiveness circuit 33 gives effectiveness, such as delay and RIBABU, to the musical-sound signal generated in the sound-source circuit 32 according to the efficacy parameter supplied, and supplies it to a sound system 34. A sound system 34 changes and pronounces the musical-sound signal of the digital format supplied to analog format including a D/A converter and a loudspeaker.

[0044] In addition, the sound-source circuits 32 may be what kind of methods, such as a wave memory method, FM method, a physical model method, a higher-harmonic composite system, a characteristic-frequency-region composite system, and an analog synthesizer method of VCO+VCF+VCA.

[0045] Moreover, the sound-source circuit 32 may be constituted not only using what is constituted using the hardware of dedication but using a DSP+ micro program, and you may make it constitute it from a program of CPU+ software.

[0046] Furthermore, you may make it form two or more pronunciation channels, and may make it constitute two or more pronunciation channels from one sound-source circuit per pronunciation channel using two or more sound-source circuits by using one sound-source circuit by time sharing.

[0047] A control program or performance data can also be stored in the hard disk in HDD25. By reading a control program etc. from a hard disk to RAM21, the same actuation as the case where ROM22 is made to memorize a control program etc. can be set to CPU23. If it does in this way, an addition, version up, etc. of a control program etc. can be performed easily.

[0048] Moreover, CD-ROM can also be made to memorize a control program or performance data. A control program, performance data, etc. can be copied to a hard disk from CD-ROM. New install and version up of a control program etc. can be performed easily.

[0049] It can connect with the communication networks 36, such as LAN (Local Area Network), and the Internet, the telephone line, and can connect with the server computer 37 through this communication network 36, and the communication link interface 26 can download a control program, performance data, etc. from the server computer 37 in external storage 25 or RAM21 grades, such as HDD. The electrohone used as a client transmits the command which requires download of a control program, performance data, etc. of the server computer 37 through the communication link interface 26 and a communication network 36. When this command is received, a control program, performance data, etc. which were demanded are distributed to electrohone through a communication network 36, and electrohone receives these control programs, performance data, etc. and is accumulated into external storage 25 or

RAM21 grade through the communication link interface 26, download completes the server computer 37.

[0050] Drawing 6 is a flow chart which shows the processing which CPU performs. Song data maintenance mode is started by SA1. The song data into which it changes by SA2 are chosen from a floppy disk etc.

[0051] At step S1, selected song data are copied to the edit buffer in RAM. For example, when selected song data are memorized by the floppy disk etc., selected song data are copied to RAM from a floppy disk etc.

[0052] At step S2, a truck to make a change in song data with directions of a user is chosen. For example, one truck is chosen from the 1st truck to the n-th trucks.

[0053] The initialization data in the performance data of the selected truck are expressed to the display screen as step S3. A user can check the contents of initialization data.

[0054] Processing S10 is processing which actually changes performance data including step S4 - S9. Hereafter, each step is explained.

[0055] In step S4, a parameter to make a change in initialization data is chosen from directions of a user. For example, cursor is moved to the location of the parameter which a user wants to change on the display screen.

[0056] At step S5, the selected parameter is changed with directions of a user. For example, the sound volume 50 of initialization data is changed into sound volume 80. A user can specify the class (for example, sound volume) of parameter, and the value (for example, modification before is 50 and the modification back is 80) of a parameter. Moreover, a user can choose maintenance modes 1-4.

[0057] At step S6, said parameter and parameter of the same kind are sequentially retrieved from the head of real performance data. For example, what is necessary is just to search the event of control number #7, when searching the MIDI event of sound-volume modification.

[0058] At step S7, it is confirmed whether said parameter and parameter of the same kind exist in real performance data. In existing, according to the maintenance mode chosen above, it changes the parameter searched by progressing to step S8.

[0059] In step S9, said parameter and parameter of the same kind are sequentially retrieved from the following data which changed in real performance data. Then, return and the above-mentioned processing are repeated to step S7. To the last of real performance data, the above-mentioned processing is repeated and it progresses to step S11 after that.

[0060] The changed data are checked at step S11. For example, a user can check the

data after modification by displaying the performance data after modification on a display screen, or making it pronounce based on the performance data after modification.

[0061] At step S12, it is confirmed whether preservation of the performance data after modification was directed by the user. When preservation is directed, it progresses to step S13 and data are rewritten. For example, the performance data after modification in RAM are copied to a floppy disk. Then, processing is ended. When preservation is not directed, processing is ended without rewriting data.

[0062] In addition, in step S1, although the case where song data were copied to an edit buffer from a floppy disk etc. was explained, performance data, such as a floppy disk, may be rewritten directly, without using an edit buffer.

[0063] According to this example, the change can be made about the whole performance data only by a user directing modification of initialization data. Even if it is the case where the user has misunderstanding as there is little knowledge about performance data and modification of initialization data is effective in the whole performance data, the performance data in alignment with an intention of a user can be changed.

[0064] Moreover, at this example, although one parameter change is once made by actuation, two or more parameter change may be made by synchronization.

[0065] Moreover, a user can change performance data by choosing maintenance mode according to his liking or performance environment. Furthermore, when the edit function of common performance data is used, simple modification is possible like changing into other values from a certain value, but when the values to change are scattered in performance data, complicated modification that a user finds out and changes all the values is difficult. The performance data modification equipment by this example can make a complicated change by easy modification actuation of a user.

[0066] In addition, initialization data are not limited to the data before the note-on event of performance data which appears first most. It is good also considering the parameter value of real performance data which appears first most as initialization data of each parameter.

[0067] Moreover, initialization data may be behind another field, for example, performance data, etc. not only with what is contained in performance data like this example but with performance data.

[0068] This example is not limited when changing sound volume, but it can also change other events or parameters. Although a numeric value may change continuously, sound volume is not limited when changing the event or parameter of such a property. It can apply, also when changing a tone number (program change). Since a tone number does

not have semantics in the magnitude of the number, it differs in a property with sound volume. In the case of a tone number, it is not desirable to apply maintenance mode 3 (drawing 3) and maintenance mode 4 (drawing 4). When changing the tone number in initialization data into 2 from 1, the tone number 1 in real performance data can be searched, and the tone number 1 can be altogether changed into the tone number 2. It is not necessary to change about other tone numbers.

[0069] Or all may be changed into the tone number 2 also about other tone numbers, and you may make it delete all.

[0070] The gestalt by not only the gestalt of electrohone but the personal computer and application software is sufficient as the performance data modification equipment by this example. Application software is stored in storages, such as a magnetic disk, an optical disk, and semiconductor memory, and you may make it supply it to a personal computer, and may make it supply it through a network.

[0071] Not only when built in sound-source equipment or electrohone, but each is equipment of another object, and this performance data modification equipment seems moreover, to connect each equipment using means of communications, such as MIDI and various networks. This performance data modification equipment may be used in case performance data are edited with karaoke equipment etc. Furthermore, it is also applicable not only to a keyboard instrument but a stringed instrument type, a wind instrument type, a percussion instrument type, etc. The performance data of an automatic performance piano may be applied to the equipment recorded or reproduced.

[0072] A format of performance data Others [Standard MIDI File], The "event + relative time amount" which expressed the generating time of day of a performance event with the time amount from the event in front of one, The "event + absolute time" which expressed the generating time of day of a performance event with the absolute time in music or a vibrant tune, the min of the "pitch (rest) + mark length" who expressed performance data with a pitch, ** length, or the rest and rest length of a note, and a performance -- formats, such as a "solid method" etc. which memorized the performance event to the memory area corresponding to the time of day when the field of memory is secured for every resolving power at, and a performance event occurs, are sufficient.

[0073] The method of changing Il Tempo of an automatic performance may change what changes the period of the Il Tempo clock, the thing which leaves the period of the Il Tempo clock as it is, and corrects the value of timing data, and the value which counts timing data in one processing.

[0074] Song data may be the format in which the data of two or more channels were

intermingled, and may be the format from which the data of each channel have parted for every truck.

[0075] Although this invention was explained in accordance with the example above, this invention is not restricted to these. For example, probably, it will be obvious to this contractor for various modification, amelioration, combination, etc. to be possible.

[0076]

[Effect of the Invention] Since the modification directions can be confirmed over the whole performance data only by directing modification of initialization data according to this invention as explained above, a user can change performance data by easy actuation.

[Translation done.]

CLAIMS

[Claim(s)]

[Claim 1] The performance data modification equipment have a modification directions means change the performance data which consist of initialization data and real performance data and are equipment and direct modification of the data in initialization data, a retrieval means search the data to which said modification was directed, and data of the same kind out of real performance data, and a modification means carry out modification or elimination according to said directed modification in said searched data.

[Claim 2] The procedure of being the record medium of the program which changes the performance data which consist of initialization data and real performance data, and directing modification of the data in a initialization data, b) Medium which recorded the program for making a computer perform the data to which said modification was directed, the procedure of searching data of the same kind out of real performance data, and the procedure of performing modification or elimination for the data by which the c aforementioned retrieval was carried out according to said directed modification.

[Claim 3] The performance data modification approach of being the approach of changing the performance data which consist of initialization data and real performance data, and containing the process which directs modification of the data in a initialization data, the data to which the b aforementioned modification was directed and the process search data of the same kind out of real performance data, and the process carry out modification or elimination according to said directed modification in the data by which the c aforementioned retrieval was carried out.

[Translation done.]

Drawing 6 (FIG. 6)

START SONG DATA MAINTENANCE MODE — SA1

CHOOSE SONG DATA TO BE CHANGED — SA2

COPY SELECTED SONG DATA
TO EDIT BUFFER — S1

CHOOSE TRUCK — S2

DISPLAY INITIALIZATION
SETTING DATA — S3

S10

CHOOSE PARAMETER TO MAKE
CHANGE IN INITIALIZATION
SETTING DATA — S4

CHANGE SELECTED PARAMETER — S5

SEQUENTIALLY RETRIEVE
PARAMETER FROM HEAD
OF PERFORMANCE DATA — S6

DOES PARAMETER
EXIST ? — S7

NO

YES

CHANGE SEARCHED PARAMETER — S8

SEQUENTIALLY RETRIEVE
PARAMETER FROM DATA
NEXT TO CHANGED DATA
IN PERFORMANCE DATA — S9

S11

CHECK CHANGED DATA

S12

PRESERVE ?

YES

NO

S13

REWRITE
DATA

END